Measuring IV&V ROI

Arde Bedjanian

GreenDart Incorporated

A HUBZone Certified Small Business

302 W. 5th St, Suite 309
San Pedro, CA 90731

www.greendart.aero

11 September 2012

HUBZone
Historically Underutilized Business Zone
CERTIFIED

GreenDart

Topics

- Overview
- 3-step ROI model
- Step 1 – detailed discussion
- Step 2-3 overview

Overview

"We need IV&V but can't afford to do it."

- Federal program budgets are severely constrained
- Development program execution performance in decline
- IV&V market in decline over same period
- We sit on 50+ years of proven IV&V results
- Need "game changer" ROI message – <u>real</u> cost savings

"We need IV&V and can't afford <u>NOT</u> to do it."

3-Step ROI Model

- Step 1: redefine expected program execution costs
- Step 2: identify IV&V-addressable program savings
- Step 3: define IV&V costs required to achieve savings

- Other considerations:
  - Include post-delivery in ROI model

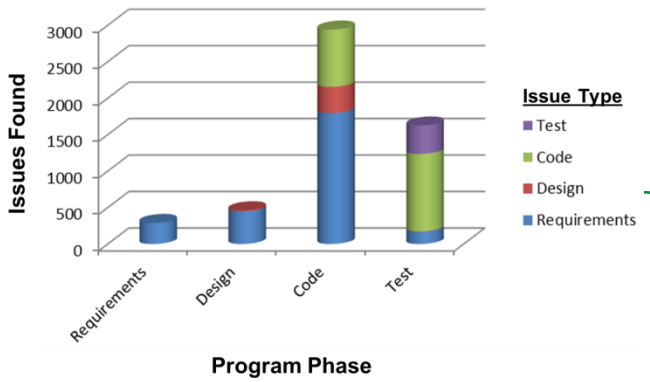
Program Execution Cost Driver

- ***Software Delayed Defect Detections (D3)***
- Many programs are at risk for cost growth and schedule delays because of software development issues*
  - Only 69% of S/W defects corrected in the software development phase in which they occurred
  - Capturing software defects in-phase is important because discovering defects out of phase can cause expensive and schedule consuming rework later in programs

* GAO 2010 Findings

D3 Impacts to Execution Costs

NASA IV&V Metrics*



	Development Phase Issue Detected					
Fix of:	Requirements	Design	Code	Test	Integration	Ops
Requirements	1	5	10	50	130	368
Design		1	2	10	26	74
Code			1	5	13	37
Test				1	3	7
Integration					1	3

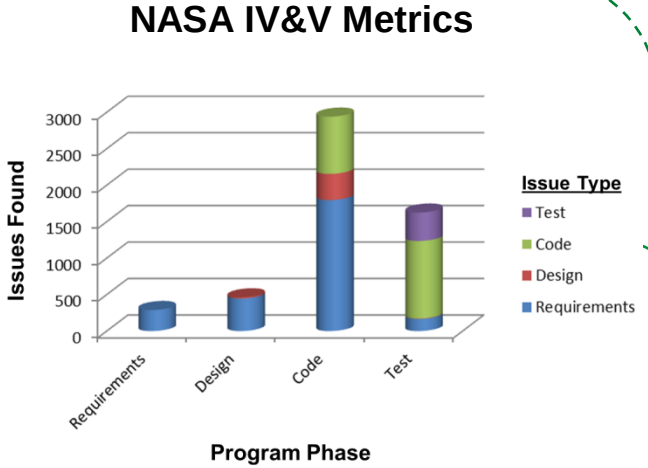
10X Increase In Correction Costs (through Test)

10X is BIG…But, How Big in Terms of $$$?

** Return on Investment for Software IV&V 2006; NASA IV&V Value Report 2008 & 2009*

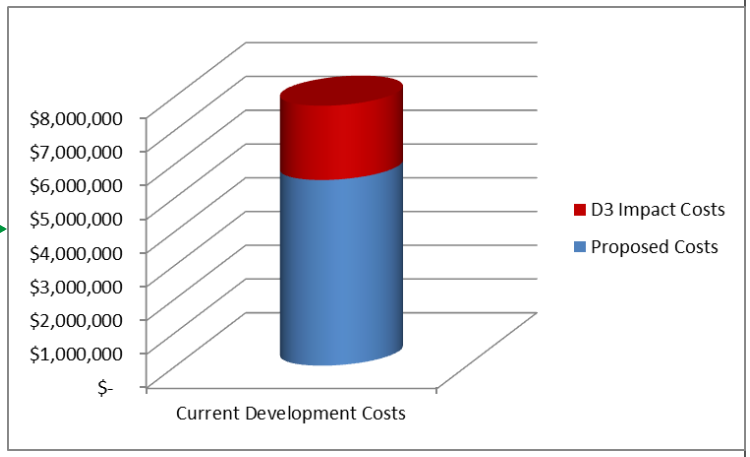
GreenDart

Converting 10X into Real $$ Savings



	Development Phase Issue Detected					
Fix of:	Requirements	Design	Code	Test	Integration	Ops
Requirements	1	5	10	50	130	368
Design		1	2	10	26	74
Code			1	5	13	37
Test				1	3	7
Integration					1	3

Unique Program Inputs



Example: $5.5M Impacted by $2.5M D3 Costs

GreenDart

D3 Challenges

- Metrics
  - Finding relevant and credible data
  - Integrating various data types/units
  - Integrating various data fidelity levels
  - Interpreting results
- Lack of truth model (e.g., Cocomo)
- "Every program is unique"
  - …so what is common?

Conclusions

- Step 1: redefined execution costs **Achieved!**
- Step 2-3 Overview
  - Step 2: identify IV&V-addressable program savings
    - Quantify IV&V impact on D3 costs
  - Step 3: define IV&V costs required to achieve savings
    - Correlate D3 savings against IV&V cost model
- Achieve ROI goal: quantify savings against cost of IV&V

"We need IV&V and can't afford NOT to do it."